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Blight of

PEARS

APPLES

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QUINCES

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UNITED STATES DEPARTMENT OF AGRICULTURE



Blight of

PEARS

AND

APPLES

QUINCES

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WHAT IS IT?

The common and frequently destructive disease called pear blight, fire blight, or simply blight, is caused by a bacterial organism. Pears and quinces are extremely susceptible, but the organism also attacks apples and at times damages ornamental plantings of hawthorn, spirea, flowering almond, and mountain-ash. It attacks (1) the blossoms and often the young fruits, causing them to blacken and die; (2) the tender tips of twigs and water sprouts, often killing the twigs back for a foot or more and causing the leaves to turn black but not fall (fig. 1); and (3) spurs, large branches, trunks, collars (bases of trees), and even roots, chiefly by extension of the disease from infected blossoms, twigs, and water sprouts. Invasion of large branches, trunks, collars, and roots may result in the death of a part or all of the tree in one season.

The disease is so destructive to Bartlett, Clapp Favorite, Bosc, Flemish Beauty, and other high-quality pears that these varieties can be grown commercially in only a few favored localities. The blight organism sometimes destroys many of the blossom clusters and young shoots of susceptible apple varieties such as Jonathan, Yellow Transparent,

Wealthy, and Transcendent Crab. Although destructive in some seasons to apples, the blight does not prevent the commercial production of even the susceptible varieties.

HOW IT OVERWINTERS

Blight appears during the blossoming season and is generally active until rapid growth of the tree ceases, usually about a month thereafter. The bacterium causing blight winters over, chiefly in the areas of thick, fleshy bark on large branches and trunks, and even roots, which it has invaded during the previous year. Occasionally it may also live over winter in twigs or small branches if conditions are such that the infected places do not dry up during the summer. From these so-called holdover cankers the bacteria are carried to the open blossoms, and from blossom to blossom and from tree to tree by insects visiting the blossoms for nectar and pollen. From the diseased blossoms the bacteria are carried to the twigs and water sprouts by insects and probably to some extent by rain. Usually with the coming of summer, the hardening of tissues and the occurrence of hot, dry weather prevent new infections, and the old ones die out, except those so favorably situated that drying out is prevented. These are chiefly deep-seated infections in the thick bark of the larger branches, trunks, and collars and in the roots; they are the holdover cankers mentioned above.

¹ The original edition was prepared by John W. Roberts, principal pathologist.



FIGURE 1.—Blight of pear twig.

CONTROL

The most important control measure is the removal of the holdover blight. During the late summer the trees should be gone over at least once and all blighted twigs cut out, the cut being made through healthy wood well below the blighted part. Special care should be taken to detect and cut out blighted areas on large limbs, trunks, and collars, the cuts being run into healthy tissues and down into the roots, if necessary. The trees should be reinspected in the fall or winter after the leaves are off, and all holdover areas that were previously missed should be removed. Another inspection in early spring is desirable. After every cutting operation the cut surfaces and tools should be sterilized with corrosive sublimate, 1 part to 1,000 parts of water, or with Reimer's solution, consisting of 1 ounce of corrosive sublimate and

1 ounce of mercuric cyanide in 4 gallons of water. Both of these chemicals can be obtained at drugstores. Corrosive sublimate is sold in tablet form with directions for making up a 1-to-1,000 solution. *These chemicals are deadly poisons and should be treated as such.* Since these solutions will corrode metals they should be kept in glass or wooden containers, and all tools should be carefully cleaned after use.

Removing blighted blossoms and twigs as they appear in the spring is usually impracticable, except when only a few trees are affected. Even then, unless great care is taken to cut well below the infected areas and to sterilize the tools between cuts, this practice may result in new infections. Unless the trunk and main limbs are threatened, it is better to postpone cutting until late summer or fall, when blight is no longer active.

Where only a few blossoms and tips of branches are affected, as is so often the case with apple trees, little damage is done. The dead parts should be removed before the next growing season, because they often harbor other organisms that cause disease.

The wounds and cuts larger than 2 inches in diameter may be painted with a good white-lead paint, with a prepared tree paint, or with a coal-tar-creosote paint, which may be made at home by thinning ordinary commercial coal tar with creosote oil until it has the consistency of a thick paint. Usually this requires about 1 part of creosote oil to 3 parts of coal tar. This paint disinfects and protects the wound or cut, but care should be taken not to cover live bark with it. Although removing holdover blight is the most important control measure, it will not protect the trees of an individual orchard from becoming infected if adjoining orchards contain holdover cankers. Old and usually worthless pear trees are often sources of infection for nearby apple orchards because of numerous holdover cankers.

A chemical solution containing zinc chloride, which penetrates the tissues and kills the bacteria, has been successfully used in some States as a substitute for canker removal.

In addition, many growers use weak bordeaux mixture (2 pounds copper sulfate, 6 pounds hydrated lime in 100 gallons of water), dilute solutions of commercial copper spray preparations, copper-lime dust (20 parts copper sulfate, 80 parts hydrated lime), or zineb ($1\frac{1}{2}$ to 2 pounds in 100 gallons of water) for blight control. Streptomycin, an antibiotic, or a mixture of it with a small quantity of Terramycin also has given promising blight control. These materials should be applied when 25 to 30 percent of the blossoms are open and again at 7 and at 14 days later.

The amount of active antibiotic ingredient varies in the different preparations. Therefore, the manufacturer's directions should be carefully followed in preparing these spray solutions.

The application of copper-containing sprays or dusts during the blossom period is very apt to cause fruit russetting. This risk of injury can be avoided by the use of zineb or antibiotics mentioned above. No insecticide should be used with any of these blight-control sprays or dusts because of danger to bees.

Trees of susceptible varieties are less likely to be seriously injured if not stimulated to rapid succulent growth by heavy fertilization and heavy pruning.

Since the practical methods of control will vary somewhat in different parts of the country, growers should consult their county agents or experiment stations for methods applicable to their localities.

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